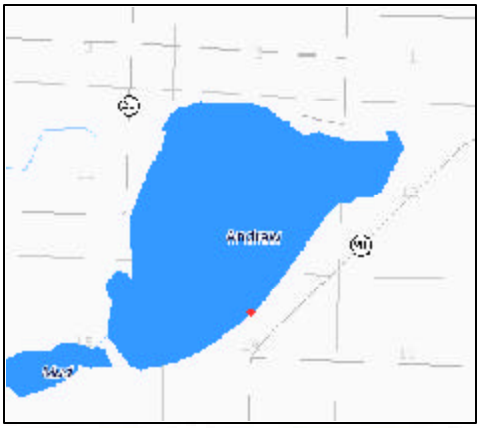
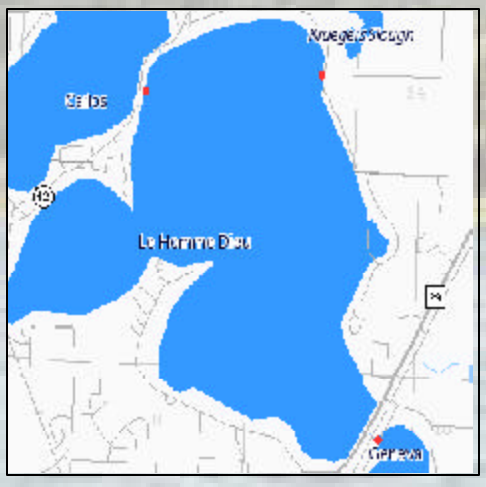
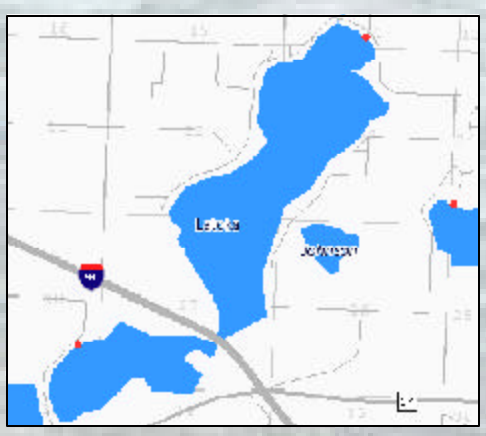
ALEXANDRIA LAKES AREA LAKE PLAN







Project Participants

Douglas County Land and Resource Management
Lake Andrew Lake Association
Lake Latoka Lake Association
Lake L'Homme Dieu Lake Association

Project Funding

This project was funded by a grant from the Minnesota Board of Soil and Water Resources

JANUARY 2003

This plan was created through the combined efforts of some dedicated citizens who volunteered their valuable time. Without them, their vision and their valuable time, none of this would be possible.

TABLE OF CONTENTS

CURA Center for Urban and Regional Affairs

University of Minnesota University Libraries John R. Borchert Map Library

Community Growth Institute

ALEXANDRIA LAKE PLANNING REPORT

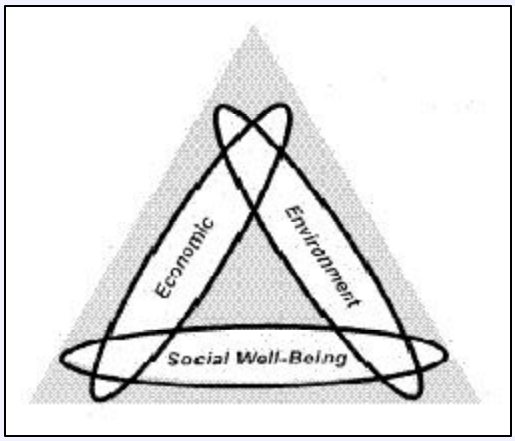
The purpose of this project has been to help each participating lake association develop a vision of what they want their lake and the surrounding watershed to look like in 20 to 30 years and to help them discover what needs to be accomplished to achieve that vision.

iNTRODUCTION

This project has involved three lake associations - Lake Andrew, Lake L'Homme Dieu and Lake Latoka - and their surrounding watersheds. The project objective was to develop long-term lake management goals and policies for each lake. These individual lakes are all part of a larger community comprising the primary wholesale/retail center of Alexandria, the surrounding lakes and their urbanized shorelines. This regional area of about 30,000 people is one of the fastest growing areas of the Upper Midwest in both jobs and population. Every indication is that this growth will continue. How this growth is managed will determine not only the quality of life for present and future residents and visitors, but also the amount of economic opportunity available in the area.

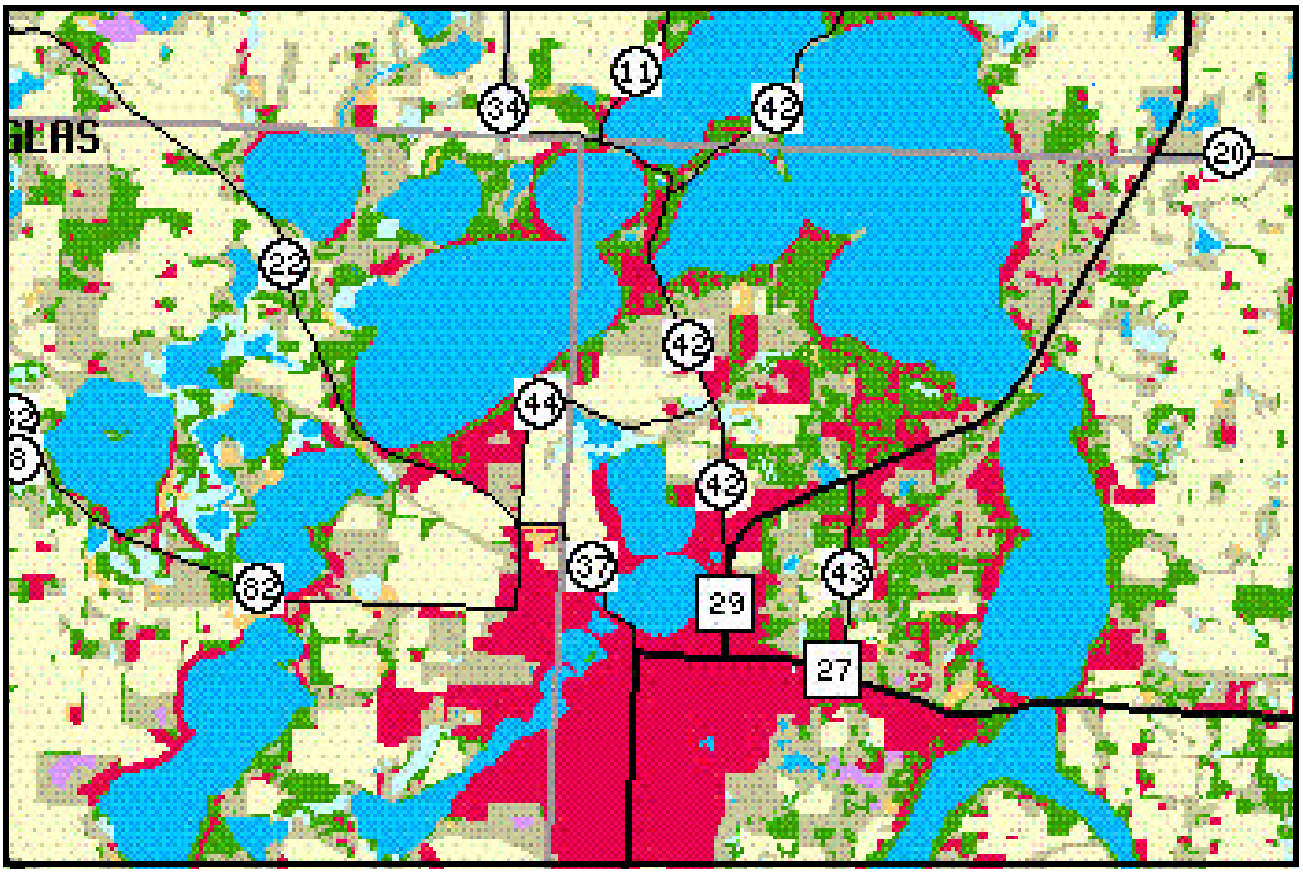
The lake planning process utilized both public meetings and extensive questionnaire surveys. Results of these efforts across all three lakes were similar and there is a large degree of consensus. The key findings of the project are that the water quality of the lakes needs to be maintained or improved and that the outdoor recreation and visual amenities provided by the lakes need to be of high quality.

SUSTAINABLE DEVELOPMENT



The lake planning process is based on the concept of Sustainable Development. Sustainable Development is a planning tool that balances preservation of the natural environment, quality of life and increasing economic vitality. It is a recognition that these elements are critically interrelated and that the economic health of a community is dependent on preserving the natural quality of the environment and the quality of life. Sustainable Development encourages diversification and development of the economy in a way that provides stability and prosperity for the entire community.

Project participants have concluded that, in order to succeed in attaining these goals, both a watershed and area wide planning and implementation approach is required. For that reason, we have structured the common parts of each lake plan into a regional context and most of our action steps relate to the regional community rather then each lake individually. These goals need to become part of an evolving Greater Alexandria Lakes Area Plan.



GREATER ALEXANDRIA REGIONAL AREA

ALEXANDRIA LAKE REGION 1970-2000

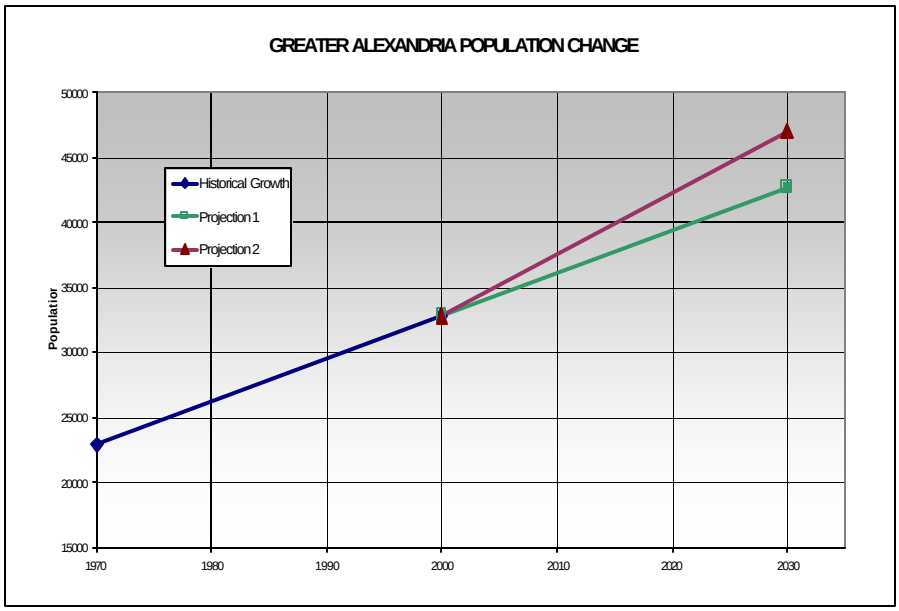
Population growth of 43% - almost 10,000 people (22,910 to 32,821)

Since 1970 Douglas County has grown substantially. The growth reflects a pattern seen in other areas with high amenities. In Minnesota, all of the lake regions with high quality lakes grew at similar or faster rates. This same pattern shows up in all high-amenity areas of the United States and is expected to continue as the electronic revolution makes distance and location less important for business and allows more people to live in places where they recreate.

Emergence of Alexandria as a multi-county regional center for shopping and employment.

Greater Alexandria (the city plus the lakes) is one of the fastest growing regional centers in Minnesota. Between 1990 and 2000 the population grew by almost 1/5 and the number of jobs in Douglas County increased by 5,009 - an increase of 44%. Greater Alexandria is a major commute employment center, shopping and service destination point for a large part of central Minnesota. This growth has transformed the region from an agricultural based economy to a new economy based on manufacturing, retail and services. The number of jobs increased from 11,481 to 16,490. For context, the ten-year job increase of just over 5,000 is over five times the total

number of people employed in agriculture in 2000. The number of jobs added between 1990 and 2000 in the healthcare and education sectors alone was equal to the entire employment in the agriculture sector in 2000. The increase in manufacturing jobs between 1990 and 2000 was double the total employment in agriculture in 2000.



The decline of agriculture as a major employment sector.

Between 1990 and 2000 the work force employed in agriculture and forestry declined from 991 to 818. The work force percentage declined from 9% to 5%. Most income in this sector was generated through subsidy payments.

Most high quality lakeshore fully developed.

Most of the high quality lakeshore is developed. Much of the new development is expansion and replacement of existing structures and development of poorly drained, marginal shoreline. The marginal shoreline now being developed has, over the last few decades, provided what little quality wildlife and fish habitat remains. As these areas are developed, the loss of habitat becomes an increasingly critical issue.

The development of the only regional sewer system in a major lake region.

Greater Alexandria is the only urban area outside the Twin Cities and Duluth that has developed a region-wide sewer system. This is the only major lake region in Minnesota where the waste management problem has been handled in a comprehensive manner. The system is high quality and aggressively maintained. The large amount of sewered land is a positive driver of job creation and has protected the lake resource from wastewater pollution. The vision and courage it took to build this system was tremendous. The total investment to date has been about $50 million dollars, which is a fraction of what it would cost to create the system today.

This is the only major lake region in Minnesota where the waste management problem has been handled in a comprehensive manner.

Continued growth adding between 10,000 and 14,000 new residents and 4,000 to 6,000 new dwelling units

For this project, two growth projections were developed. The first projection is based on the assumption that the Alexandria area will add the same number of people in the next 30 years as it did in the last 30 (10,000). If family size stays the same at 2.4 persons, an additional 4,000 dwelling units will be needed.

The second projection is based on the assumption that the Alexandria area will grow at the same percentage rate, 43%, over the next thirty years. Under this assumption, 14,000 new people will be added and an additional 6,000 dwelling units will be required.

Note that a much higher number would have been predicted if the growth rate over the last decade was assumed instead of the growth rate of the last three decades. Also note that the state demographer's projections have been updated and are now near those in this study.

Continued growth as a regional center for services and manufacturing.

The area will most likely continue to grow much like it has during the last 10 years. The baby boomers will add growth to the region as they continue to relocate to high amenity areas with high quality services. Areas of manufacturing, health care, education and retail will continue to dominate. There will still be many long-range commuters, but with the sewer and high quality lakes it will likely be fewer than in other growing areas of the state. The maintenance and management of the lake resource becomes a key determinate to maintain the future economy. The lakes will be the backbone of the Greater Alexandria park and open space system.

Most of the new growth will be near the lakes adjacent to the existing sewer lines or nearby areas where extensions are most cost effective.

Due to the availability of sanitary sewer connections, much of the future growth will be close to existing development and near the lakes. The immediate watersheds of the major lakes will be greatly impacted by future development, which will displace both forest and agriculture lands. Management of urban runoff problems will become very important, and the historic agriculture drainage systems will need to be converted to urban storm water management uses.

Increased use of the major lakes by residents and non- lakeshore owners.

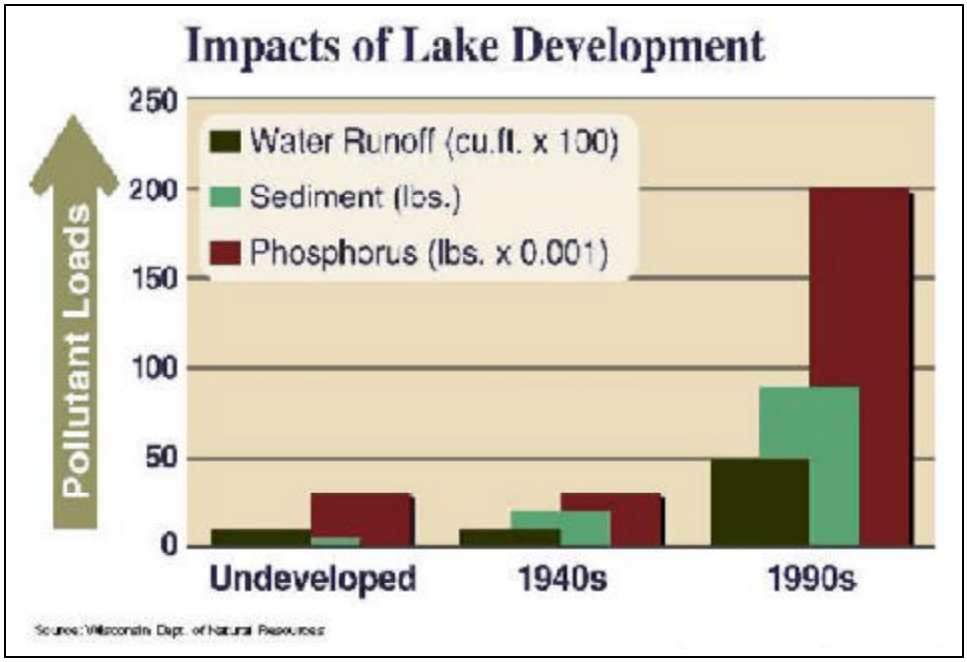
Much of the present stock of seasonal homes will be converted to year-round use or full time retirement homes. The County still has 2,700 seasonal homes, so there is a lot of redevelopment yet to happen. The lakes will form the principal recreation area for the residents living in the estimated 4,000 to 6,000 new non-lakeshore dwelling units. Their principal access to the lakes

will be through the public access system and the Greater Alexandria parks and open space system. Lake utilization will increase and higher levels of water surface use management and fisheries management will be needed if recreation use levels and quality are to be maintained.

SUMMARY OF MAJOR ACTION STEPS

Water Quality-Sanitary Sewers

Continue to capitalize on past investment by connecting all new development in the immediate watersheds of the major lakes to the extensive infrastructure of the sewer district. The District operates one of the most efficient treatment plants in the state in terms of phosphorous removal and that ranking needs to be maintained and affirmed with continuous monitoring of plant discharge and lake quality linked to the local water plan. When permitting new developments in the Greater Alexandria Area, the overall long-term cost to the homeowner needs to be emphasized over the short-term cost of the land subdivider to connect to the central sewer system.



Water Quality-Runoff Management

The lakes today are still in good shape, but they do experience some algae blooms after major rainfall events. Runoff from urban development contains high level of phosphorus, a major casue of algae blooms. The risk of major water quality deterioration is high without policy changes in runoff management to existing and new development. Although these changes have an impact on the cost of government management and lot development costs, their overall costs in relation to what has already been spent on the central sewer is small. Further, the cost of incorporating aggressive stormwater management systems into new subdivisions is insignificant when compared to the costs of retrofitting development after-the-fact to manage stormwater.

Present management of the runoff process is divided among many programs and units of

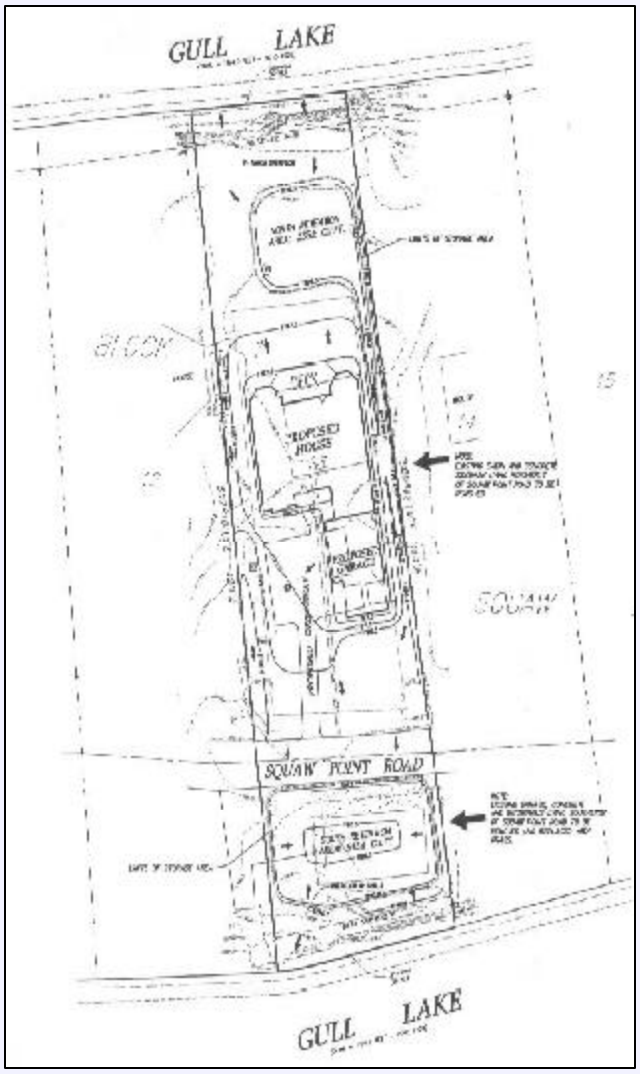
Stormwater Management

Retrofitting stormwater management devices in developed areas is usually extremely expensive. Costs for storm sewer pipes, catch basins, culverts and land acquisition for retention areas can be overwhelming. Often these costs must be assessed to property owners who don't see the direct benefit.

Redevelopment of lakeshore properties is an excellent opportunity to make minor improvements that will prevent the need for major stormwater retrofitting in the future. Stormwater management standards that are typically applied to commercial areas can easily be transferred to properties within the watershed during redevelopment.

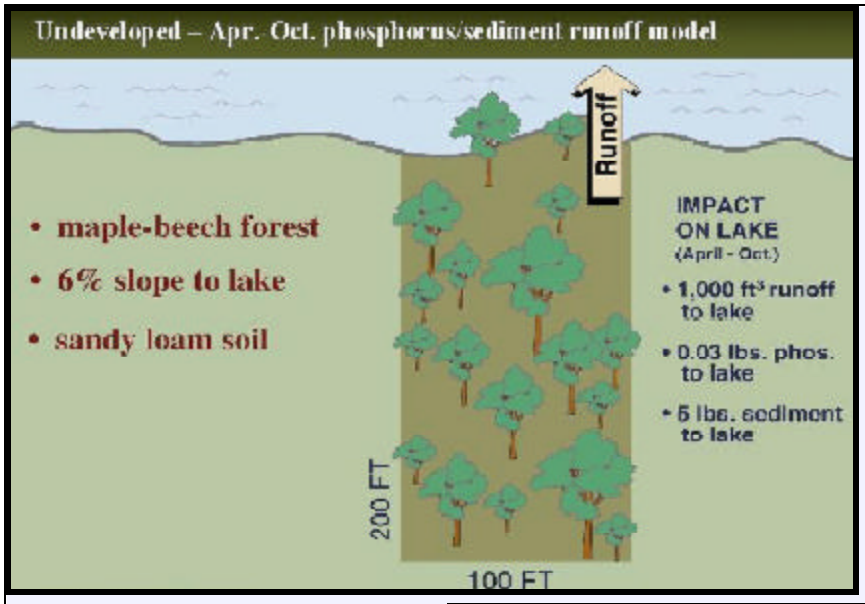
This approach has been successfully implemented in other Minnesota communities. The site plan shown here is for a home on Gull Lake in the Brainerd Lakes Area. With just a minor six-inch depression in the front and back yards, this property retains a 5-year, 24-hour rain event. The depressions are hardly noticeable to the property owner, but have a major impact on the amount of runoff from the property.

Requiring small improvements such as these when properties are redeveloped will improve lake water quality and save money in the future.

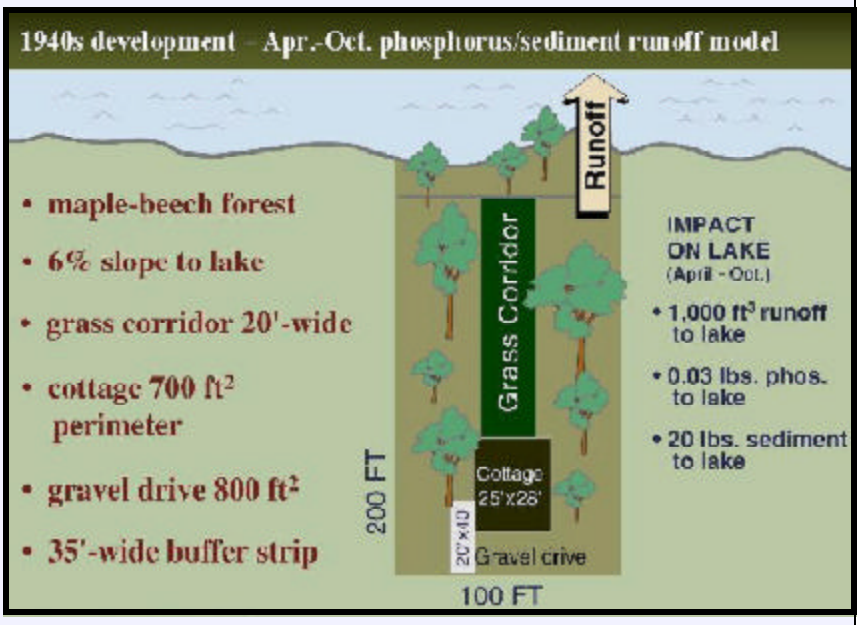


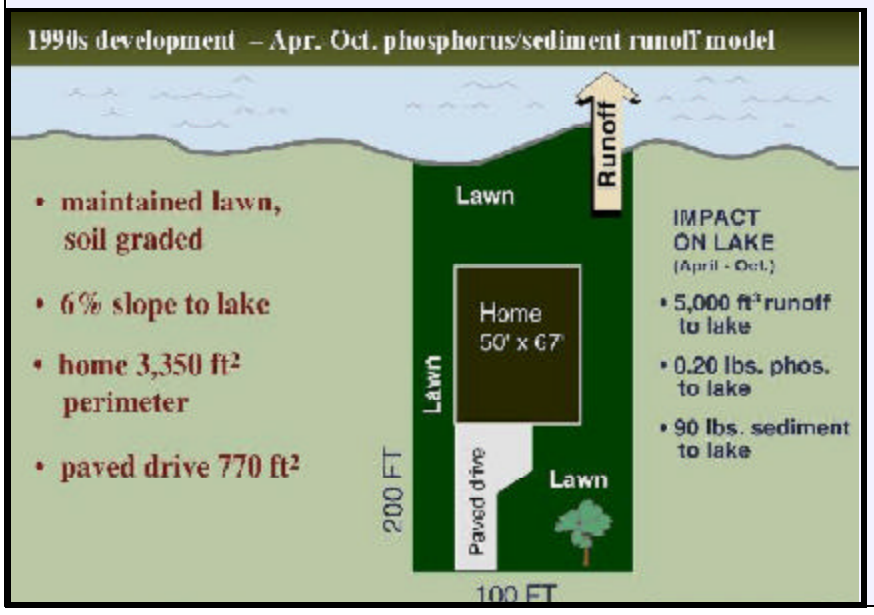
government and not targeted to sediment and nutrient management. Subdivision regulations need to updated and responsibility for managing storm water ponds needs to rest with existing organizations, such as the Sewer District, the County Highway Engineer or the City of Alexandria. County ditch administration, which is the responsiility of the County Board, is also important. In the past it was in the economic interest of the county to efficiently drain agricultural lands. That is no longer the case when drainage puts nutrients into the lakes. The evidence is strong that agriculture is a major source of nutrient loading.

The scientific and engineering tools to greatly reduce sediment and nutrient runoff are readily available and not expensive. Existing development can be retrofitted by individual lot and neighborhood landscaping, the highway system can become an efficient runoff management system, new developments can incorporate runoff plans in the subdivision process and agriculture drainage can have sediment and nutrient management standards applied.



Source: Wisconsin Department of Natural Resources





Recreation Use

The recreational use of the lakes system has very little management today, attributable mainly to failed state leadership in this area. There is a reasonably high level of user dissatisfaction, which could be improved with only minimal management techniques. Handling the increase in use from new population growth near the lakes is the biggest challenge. This means more public investment in lakeshore recreation facilities to compliment, and in some cases divert, lake use. One of the major activities of lake home-owners is walking, hiking and biking. The development of an interconnected trail system around all the major lakes would be a heavily used facility.

The answer is not always in more regulation. One innovative approach to jet-ski complaints that has been done in other areas is to creates a jet-ski recreation area in the center of one of the major lakes. This concentrates usage in areas where it causes the least disturbance. A more simple approach could be to reserve times on some lakes for low speed boating.

Fishing regulations also need to be discussed. How do we ration the same pounds of fish over a greater number of people who possess more effective fishing techniques. The State of Minnesota has fishing regulations that have not changed much in two generations.

There are some questions that are still unanswered:

- Should we manage for large game fish other than Muskies?
- Manitoba has had barbless hooks for over 10 years. Should we adopt such a strategy?
- Low limits and catch and release are accepted in most high quality recreation areas. Should we adopt such a strategy?
- Is tournament fishing actually commercial fishing?

Local Use Survey

Lakeshore property owners were surveyed to find out how they used the lake. Across all three lakes, walking and hiking were activities with the highest amount of participation, despite the fact that there are no designated trails or walkways around any of the lakes.

Those who indicated that they walk or hike by the lake 11 days or more annually:

Lake Andrew: 55%
Lake Latoka: 51%
Lake L'Homme Dieu: 74%

While walking is a low-impact activity, respondents reported that jet-skiing is an activity with a lot of impact on their enjoyment of the lake, mostly negative. Ironically, very few people reported significant use of personal water craft.

Those who indicated that they did not jet ski on the lake in 2001:

Lake Andrew: 82%
Lake Latoka: 82%
Lake L'Homme Dieu: 75%

These results should have an impact on how the lake resource is managed.

GOALS FOR GREATER ALEXANDRIA LAKE MANAGEMENT

This section outlines specific goals and strategies to implement policies to maintain and improve water quality and improve the recreation qualities of the lakes to maximize the benefit to all users. For each issue identified in this process, a goal has been developed. Specific action steps are then recommended to achieve the goal. The goals are the most important part of this section. As different strategies are implemented and refined, Lake Associations should continue to focus on the goals as the overriding objective to their actions.

WATER QUALITY

The number one issue identified in all of the surveys done as part of this study was concern over water quality.

ISSUE --> goal --> action

Exotic Species

Issue: Introduction of exotic species will reduce the aesthetic appeal and recreation potential of Douglas County lakes.

Goal: Keep all known exotic species from becoming established in Douglas County lakes.

Action:

1. Assign a committee to check each lake three times a year for the presence of known exotic species
2. Educate property owners and lake users about what exotics are, what they look like, and where they are typically found.
3. Form a committee to be at public accesses on peak days (e.g. fishing opener, fishing tournament dates) to educate lake users on how to inspect their boats and identify exotic species.
4. Encourage residents and lake users to watch for exotics while they are using the lakes.

Waste Water Management

Issue: Improperly treated wastewater from urban development can contaminate groundwater and surface water resources.

Goal: Develop and implement a comprehensive waste management plan for the Alexandria Lake Region that maintains and restores high water quality for both surface and groundwater resources.

Action:

1. Support continued high efficiencies of tertiary treatment at the regional sewer plant.

Eurasian Water-milfoil (*Myriophyllum spicatum*)

Eurasian water-milfoil, a member of the water-milfoil family (*Haloragaceae*), is a submersed aquatic perennial.

Eurasian water-milfoil is indigenous to Europe, Asia and North Africa. Thought to have been intentionally introduced into the United States from Eurasia, it was first documented from a pond near Washington, D.C., in 1942. Since then, it has spread into at least 43 states both by intentional planting and accidental transfer by boating equipment. It thrives in still waters and slow streams. It spreads by vegetative propagules and stem fragments carried to new sites by water currents. Today the introduction of stem fragments to new water bodies occurs by transport on boating equipment, i.e., on trailers or propellers. Eurasian water-milfoil is one of the most widespread of all exotic aquatic plants and is still expanding.

This plant begins growth in early spring before most natives, quickly growing to the surface, forming large, heavy, floating mats of vegetation. Long underwater stems branch as they approach the surface, where they produce whorls of three or four finely divided grayish-green leaves. These mats obstruct water traffic and prevent light penetration necessary for the growth of native aquatic plants, displacing and reducing natural diversity. Eurasian water-milfoil has less food value for waterfowl than native plants. While fish may find the cover a temporary advantage, it eventually becomes a disadvantage as the dense mats result in degradation of the abundance and diversity of invertebrates necessary to support the food chain. The dense growth may also cause reduced dissolved oxygen levels from decaying mats of vegetation.

Source: The New York Botanical Garden

2. Integrate sewer hookups into subdivision regulations to assure new developments systematically hookup to the existing sewer system. Use zoning regulations and larger minimum lot sizes for non-sewered lots to discourage development not connected to the sewer system.
3. Develop and integrate a region wide comprehensive development plan and sewer plan into a single plan.

Monitoring

Issue: Continuous and comprehensive water quality monitoring is needed on a long-term basis to assess the need and effectiveness of programs to improve water quality.

Goal: Maintain and improve the present water-quality monitoring program of the lakes system.

Action:
1. Maintain and when possible improve the continuous water testing and monitoring program working with the Douglas County Lake Association and the County Water Plan. Expand the program to include both the K12 and higher education systems and link this to the Sewer District monitoring of discharge and lake quality.
2. Continue participation in the Citizens Lake Monitoring program.

Surface Water Runoff Management

Careful surface water runoff management in immediate lake watersheds is critical to maintaining or improving water quality in the Alexandria lake region. This section outlines the issues policies and recommended actions needed to maintain water quality and still accommodate

continued growth. Major areas requiring action include:

- Present urban development on lakeshore,
- New urban development within the watershed,
- The transportation system, and
- Agricultural lands.

In addition to each of these land uses are natural systems and areas of sensitive resources, where additional management is needed to conserve the resource.

Present Urban Development on lakeshore

Issue: Lake water runoff from homes and other developments on the lake polluting the water.

The new style of development being seen on area lakes is a dramatic change from the small weekend cabin of the past. Without stormwater managememt, this type of development negatively impacts water quality by increasing the volume and sediment content of stormwater runoff and decreasing the amount of time it takes stomrwater to reach the lake.

Goal: Reduce the quantity and improve the quality of water runoff from parcels already developed within the watershed. Water from all normal storm events should be contained on the property. Develop land management practice guidelines and projects that minimize erosion and runoff and protect shore and aquatic vegetation and wildlife and fisheries.

Action:

1. Continue development of landscaping model on the Lake Andrews public water access and expand the program to all public accesses in the lake region.
2. Develop lakescaping and shoreline management models.
3. Yard management practices of condominium associations should be encouraged to manage to Audubon Standards
4. Storm water management plans need to be developed for each individual parcel.
5. The County should limit shoreline alterations (alterations within the shore impact zone) to a one-time alteration of 10 cubic yards. Alterations must be sustainable so that perpetual alteration is not required to maintain the altered state.
6. The County should limit alterations outside of the shore impact zone to 50 cubic yards. Alterations must be sustainable so that perpetual alteration is not required to maintain the altered state.
7. The Lake Associations should seek to educate people on the impacts shoreline alterations have on lake water quality.
8. The Lake Associations should use the photo survey to target sensitive lots for extra education efforts.
9. The County should specifically require that all construction on the lake use Best

Management Practices to contain nutrients on site.
10. The Lake Associations should request that the County inform them when a shoreline alteration or other construction permit on the lake is issued. Association members would use this information to monitor construction for compliance with Best Management Practices.
11. Give an award each year to the home on the lake that is an example of lake-friendly. Publish the award, a picture and a description in the lake association newsletter.
12. The County should lower the maximum allowable impervious coverage to 20% for permitted uses. Applicants would be allowed to increase to the current standard of 25% if they provided stormwater retention on site.

New Urban Development

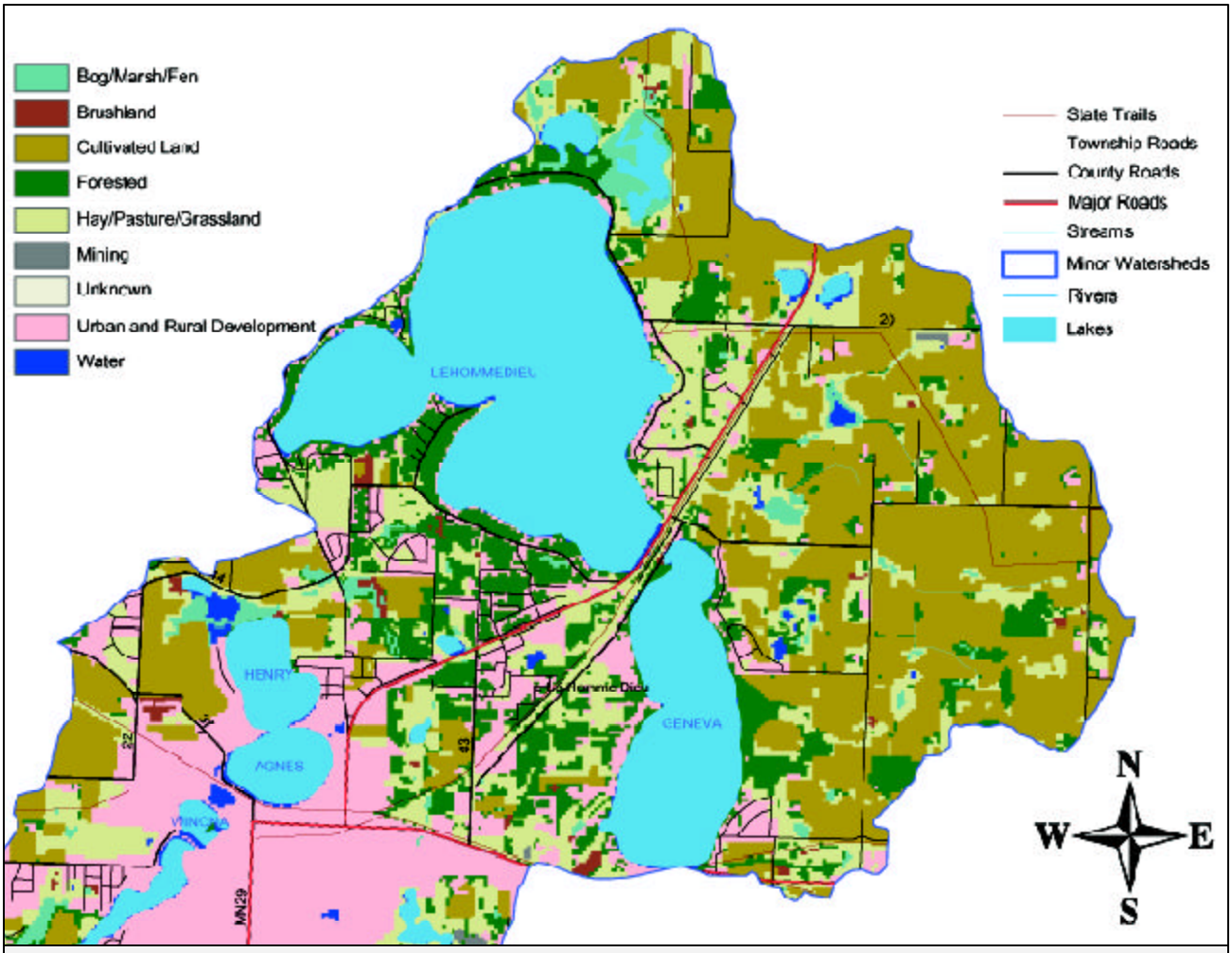
Issue: Water runoff from new residential construction within the watershed polluting the water.

Goal: Eliminate increases in runoff associated with new residential construction within the watershed. Require new construction to be lake-friendly.

Action:
1. The County should increase the minimum lot sizes within the second and third tiers to manage the overall density within the watershed.
2. Developers who want to attain current density levels should be required to do advanced stormwater management within their developments. This would include providing green space buffers within and around new developments to provide natural filtration, collection of stormwater within the development, and agreements to manage and maintain stormwater systems.
3. Developers who want to attain current density levels should be required to connect to the sanitary sewer.
4. The County should lower the maximum allowable impervious coverage to 20% for

Consensus on Runoff Impacts

Lake property owners who were surveyed expressed a high degree of concern over the impacts of runoff on water quality.
On Lake Andrew, the top two concerns identified by respondents dealt with runoff. Over 70% of respondents on the lake had concerns over water pollution from agricultural runoff and 65% of respondents felt that pollutants brought to the lake through ditches and culverts were a threat to the lake.
Results were similar on Lake Latoka where roughly 65% of respondents thought erosion and water quality as well as pollutants brought to the lake through ditches and culverts posed a problem.
Lake L'Homme Dieu respondents felt even stronger. At least 75% of respondents identified these same issues as problems.
This type of broad consensus is a sound foundation of support for taking steps to address runoff issues.



The L'Homme Dieu watershed, shown in the map above, contains a large amount of undeveloped agricultural land. This type of land is often preferred by developers due to the relatively inexpensive price and typically less restrictive regulations. Development in these areas, especially development not connected to the central sewer, will have a dramatic impact on Lake L'Homme Dieu. This scenario is repeated in the Lake Andrew and Lake Latoka watersheds.

permitted uses. Applicants would be allowed to increase to the current standard of 25% if they provided stormwater retention on site.

5. Extend membership in the lake association to residents within the watershed.

6. Educate owners of undeveloped tracts within the watershed on the impacts of development on water quality. Encourage lake-friendly development techniques.

7. Offer to facilitate either a transfer of development rights or a conservation easement for undeveloped tracts within the watershed. Both a transfer of development rights and a conservation easement has tax advantages for property owners that the Lake Association can use to promote the strategies.

8. Request that the County notify the Lake Association when a new development is proposed within the watershed.

9. Set up a development team within the Lake Association to review and comment on each new development within the watershed.

Transportation System

Issue: Most roads are presently designed to transport water to low areas as quickly as possible. That policy results in results in the transport of sediments and nutrients to lakes.

Adopt-a-Road programs have been successfully implemented nationwide. The programs are inexpensive to establish and maintain. They provide an excellent way to bring neighbors together to improve their community. This program can be starting point for other lake initiatives.

Goal: Minimize the runoff of sediment and nutrients from road systems into waters and streams and use road right-of-way as a nutrient management system for existing development. Keep the roads surrounding the lake clean.

Action:

1. Develop and implement an Adopt-A-Road program to keep the roads surrounding the lake clean and free of garbage.
2. Develop a culvert management policy that retains runoff in highway ditches and encourages groundwater recharge over surface water runoff.
3. Expand monitoring programs to include highway ditch runoff so baseline data can be established
4. Develop design standards for roadways and ditches that channel runoff into ditch systems and holding areas that trap nutrients and sediments.

Agriculture Feedlots

Issue: Feedlots produce large amounts of waste products that have detrimental impacts on water and other environmental qualities when they are located near lakes and urban development.

Policy: Limit the development of large feedlots and extensive irrigated agriculture in the immediate watersheds of the major lakes to preserve water quality and reduce land use conflicts.

Action:

1. Continue intensive waste management programs for agriculture feed lots.
2. Create a limited agriculture zone in the watersheds surrounding the major lakes with standards similar to the limited agriculture zone in Pope County. This zone limits the size of feedlots near major lakes.

Field Runoff

Issue: Water runoff from agricultural uses in the watershed polluting the water.

Goal: To decrease the amount of runoff from agricultural uses within the lake oriented watersheds and to decrease the nutrient loading associated with agricultural runoff.

Project participants struggled with agricultural issues. While respectful of the significant role that the agriculture industry has historically had, participants are keenly aware that the demographics and economics of the area are no longer based on agricultural activities. Today, the local economy is driven by the area's lake resources. Agriculture industries need to be sustainable, and they need to be compatible with the other, more critical, economic drivers. There is a need for elected and appointed officials to recognize this change and boldly address ongoing agricultural damage to lake resources.

Action:

1. Require no-net increase of runoff from parcels within the watershed that are zoned agricultural and proposing improvements that intensify crop or animal production. This would mean that agricultural uses would have to collect and manage their own storm water on-site instead of allowing it to run off to adjacent properties. Engineered stormwater management plans should be required by the County as part of permitting for tiling or other improvements.

2. Educate farmers within the watershed on the impacts of their runoff on water quality. Educate farmers on farming methods they can use that have less impact on the lake.
3. Extend membership in the lake association to farmers within the watershed.
4. Require farmers annually to list the names of the chemicals that are applied to their land.
5. Test the water annually for chemicals associated with agricultural runoff and share the results with farmers within the watershed.
6. Redirect existing drainage ditches within the watershed away from the lake. Where there is no other feasible discharge point, provide sedimentation treatment, at a minimum, prior to discharge.

LAKE SURFACE MANAGEMENT

Water Surface Management To Preserve Natural Systems

Issue: The lake resource is static but the number of users and the size and speed of boats is increasing. This is increasing the intensity of recreation use of the lake resource. Most high speed boating is concentrated on weekends between noon and 8:00 pm. Boat riding is the primary activity.

Since 1985 in the central lake region boating patterns have changed. There is less fishing and water skiing more boat riding. Boat and motor sizes have increased. Jet skies are the new major activity.

Little Known Fact

Douglas County in 2002 is receiving $17,190 from boat and water safety programs from DNR and $6,000 from the federal government.

Goal: The lake ecological resource is the key to water-based recreation and should be protected, for use by present and future generations. Native aquatic vegetation and natural shoreline areas must be preserved.

Action:

1. Keep wave disturbances by boats in sheltered areas less than natural waves from wind. There should be no high speed boating or starting and stopping in sheltered areas.

2. Map concentrations of important native aquatic plant species and mark and designate for protection the highest priority areas as aquatic plant management plant protection areas. Integrate with the Sensitive Areas Committee and the Local Water Plan. Protect these areas through marking and with speed restrictions.

3. Work with state and local units of government and private land trusts to identify potential areas of lakeshore for preservation. Lake Andrew is an obvious area to concentrate these efforts.

4. Create a land trust organization focused on the Alexandria Lake Region and linked to the county lake associations to facilitate either a transfer of development rights or conservation easements for undeveloped tracts on lakeshore and other key parcels within the immediate watersheds of major lakes. Both a transfer of development rights and a conservation easement has tax advantages for property owners.

Recreation Management

Issue: The lake resource is static but the number of users and the size and speed of the boats are increasing. Most of the new users will be transient boaters coming from the new development near the lakes.

Goal: Douglas County lakes should be managed for the greatest number of users and each user should be provided with an enjoyable experience.

Action:
1. Separate high and low speed boating uses by spatial or time zoning during peak use times.
2. Actively manage high speed boating uses by providing deep-water docks for water skiers and jet skiers and slalom courses for water skiers and jet skiers.
3. Restrict some lakes on weekends to low speed uses before 10:00 or 12:00AM and after 6:00 or 8:00PM
4. Maintain an active water and boater education program.

Recreational Uses

It may be astonishing to some, but the most popular recreational activity on the three lakes does not directly involve the lake at all.

Survey respondents on all three lakes identified walking and/or biking around or near the lake as one of the most widely participated in recreational activities. On Lake L'Homme Dieu, 92% of respondents indicated that they walk, run or bike near the lake during the summer with 76% of those surveyed indicating that they did it more than 11 times in 2001. Similar results were collected on both Lake Andrew and Lake Latoka, despite the lack of a well-developed trail system on any of the lakes.

For activities in the water, it is the more passive that are widely participated in. On Lake Andrew, 92% of respondents indicated that they participated in swimming last summer and 91% responded that they had done some pleasure boating. On the same lake, 68% water ski and only 18% ever used a personal watercraft.

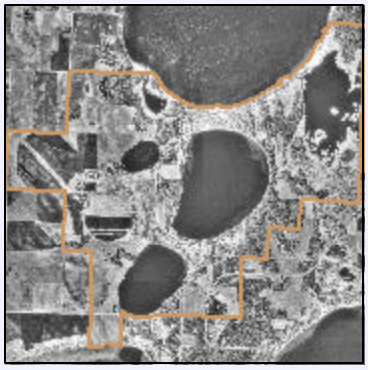
Fishing is actually only aggressively pursued by a little over half of the lake property owners. Lake Latoka, where only 44% fished 11 times or more during the summer of 2001, was typical of the three lakes. In fact, on Latoka one in five respondents indicated that they never fished at all.

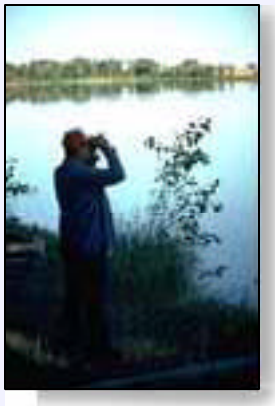
Lake Related Recreation opportunities

Issue: The lakes are the most important part of a lake region recreation system that will be serving up to 40,000 local residents and many visitors. This system includes land and water managed by the City of Alexandria surrounding townships and Douglas County. Walking and biking are major recreation uses of Douglas County lake residents.

Goal: Develop an area wide recreation plan that integrates the lake resource into an overall plan that includes active park and recreation areas such as ball fields and trails with lake oriented facilities such as accesses and beaches.

Action: Because walking, hiking and biking are major recreation uses of lake residents a trail system should surround each lake. These trails should be connected into a regional trail system.





GLENDALOUGH STATE PARK

Glendalough also offers a designated "Heritage Fishery" on Annie Battle Lake. This 335-acre lake, located near the park campground, was for the most part, a private fishing lake for many years, and its fish populations and sizes are more comparable to historic times than most public fishing lakes. Very large bass and panfish are still relatively abundant, as are walleyes of good eating size. Special experimental regulations are in effect to preserve the serenity of this undeveloped lake and give anglers the opportunity to catch these sizeable fish. As a result, visitors can experience fishing as it was 100 years ago. Current restrictions include: ***No motors.*** *This includes electric trolling motors as well.* ***No electronic fish-finding devices.*** *This includes depth finders, graphs, GPS units, and underwater video equipment.* ***Fishing is catch and release only for largemough bass and northern pike.*** *These species must be returned to the water immediately.* ***Sunfish limit is 5 per person for all sunfish species in combination. No gas-powered augers are allowed during winter fishing.***

- Source: MN DNR

Fisheries Management

Issue: Fishing pressure will continue to increase but the total pounds of fish in each lake will stay nearly the same. It is not possible to ration the same pounds of fish over a greater number of people who possess more effective fishing techniques when we have fishing regulations that have not changed significantly in two generations. Without changes in regulations and reductions in limits, the amount of time to catch each fish will increase and the size of fish will decrease.

Goal: Develop a lake region fish management plan that considers all options for fish management where the policy discussion includes barbless hooks, catch and release, balance between professional and sport fishing, regulation of fishing techniques and equipment and lakes managed for different fishing experiences.

Action:

1. Develop a proposal to create a comprehensive fish management plan for the lake region using the local water planning process in cooperation with the Department of Natural Resources Fisheries Division.
2. Begin an education program working with the Minnesota Lake Association, the Douglas County Lake Association and DNR Fisheries to inform local residents of fish management practices in other lake areas. Examples would be: Yellowstone National Park, Lake of the Woods in Ontario, Province of Manitoba, Glendalough State Park.

PUBLIC AND INSTITUTIONAL MANAGEMENT SUGGESTIONS

County
Each lake plan should be integrated into the county water and comprehensive plans.

County Lake Association
Maintain Active Membership in the Douglas County Lake Association

Lake associations need to be represented on comprehensive planning and local water planning boards.

Have an active program to encourage local voter participation in all elections.

Facilitate the Development of a local land trust organization focused on Douglas County lakes and watersheds.

Maintain Active Membership in the Minnesota Lake Association

Townships
Participate in regional planning activities for key region wide facilities such as: transportation, nutrient and runoff management, outdoor recreation, waste management and land use.

State agencies
Each state agency with programs impacting the lakes should designate a lead representative to liaison with local government and lake associations on policy and management issues. At the present time only the Board of Water and Soil Resources has a person in charge of all local programs.

Appendix A

Lake Andrew Survey Results

9. To what extent do you feel each of the following to be a problem on Lake Andrews?	Average	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Lake water pollution due to agricultural runoff	2.31	1.56	7%	24%	21%	21%	6%	21%
Water level fluctuations on Lake Andrews	2.06	1.14	24%	40%	16%	12%	1%	7%
Algae growth in Lake Andrews	2.04	1.17	13%	39%	25%	7%	1%	13%
Aquatic plant growth in Lake Andrews	2.03	1.20	19%	32%	25%	12%	0%	13%
Overall water quality of Lake Andrews	1.88	0.94	31%	34%	28%	1%	0%	6%
Pollutants brought to lake through area ditches and culverts	1.85	1.52	4%	34%	15%	12%	4%	31%
Lake water pollution due to other sources	1.78	1.23	12%	34%	25%	6%	0%	23%
Lakeshore erosion	1.78	1.09	28%	40%	12%	9%	0%	12%
Well water contamination due to agricultural chemicals	1.48	1.30	24%	22%	18%	4%	1%	30%
Improper alteration to shoreline made by property owners	1.45	1.16	34%	25%	13%	3%	1%	22%
Inadequate public service (i.e. roads, snowplowing of roads, utilities)	1.44	1.06	57%	19%	6%	6%	1%	10%
Inadequate response of public officials to your concerns	1.37	1.35	42%	9%	14%	3%	5%	28%
Improper burning of leaves and brush	1.33	1.11	57%	22%	0%	3%	4%	14%
Trees lost to disease	1.32	0.99	48%	17%	14%	1%	0%	19%
Neighbors causing disturbances (i.e. noise)	1.20	0.58	75%	16%	4%	0%	0%	4%
County land and resources ordinances not followed or enforced	1.14	1.15	44%	11%	9%	3%	2%	31%
Well water contamination due to other sources	1.12	1.01	34%	21%	12%	0%	0%	33%
Inadequate public safety (i.e. fire, health, emergency, police/sheriff)	0.94	0.58	75%	5%	3%	0%	0%	17%

15. Estimate how many *days* members of your household and guests used Lake Andrews for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Ice fishing (in a fish house)	55	60%	9%	7%	24%
Hiking/walking	52	50%	23%	4%	23%
ATV riding	53	75%	9%	2%	13%
Snowmobiling	54	61%	15%	11%	13%
Ice fishing (without a fish house)	53	64%	28%	4%	4%
Hockey	52	98%	2%	0%	0%
Ice skating (other than hockey)	52	79%	21%	0%	0%
Cross Country Skiing	53	81%	17%	2%	0%
Snowshoeing	52	94%	6%	0%	0%

16. To what extent do you feel each of the following was a problem on Lake Andrews during the past few **WINTERS,** November through March?	Count	Average	**Standard Deviation**	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Catching too few fish	50	1.56	1.33	32%	20%	14%	8%	2%	24%
People on the ice during unsafe ice conditions	50	1.40	1.09	42%	30%	4%	4%	2%	18%
Litter on the lake	52	1.29	0.89	31%	40%	6%	0%	0%	23%
Lake users operating vehicles in an unsafe manner	51	1.27	0.87	47%	25%	10%	0%	0%	18%
Litter at public landing or on the access road	51	1.22	1.10	22%	31%	10%	2%	0%	35%
Lake users being inconsiderate	51	1.10	0.76	61%	16%	6%	0%	0%	18%
Trespassing on your property	52	1.10	0.57	73%	15%	2%	0%	0%	10%
Noise from snowmobiles on the lake	50	1.02	0.59	78%	6%	4%	0%	0%	12%
Large fish house holes not marked when house is moved	49	1.00	0.98	49%	14%	4%	0%	2%	31%
Inconsiderate users of snowmobiles/ATVs on the lake	51	0.96	0.69	65%	10%	4%	0%	0%	22%
Ice blocks from fish houses not being broken up	50	0.94	0.93	56%	8%	4%	0%	2%	30%
Vandalism of your property by lake users	52	0.92	0.33	88%	2%	0%	0%	0%	10%
Not enough law enforcement on the lake	51	0.92	0.69	65%	8%	4%	0%	0%	24%
Vandalism of your fish house	49	0.92	0.49	76%	8%	0%	0%	0%	16%
Too many fish houses on the lake	51	0.88	0.48	82%	0%	2%	0%	0%	16%
Too many snowmobiles/ATV's on the lake	50	0.86	0.45	78%	4%	0%	0%	0%	18%

17. Estimate how many *days* members of household and guests used Lake Andrews for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Swimming	64	8%	25%	9%	58%
Walking/hiking	60	20%	15%	10%	55%
Pleasure boating (in motorized boat)	65	9%	23%	20%	48%
Fishing from a boat	65	14%	25%	14%	48%
Gardening/lakescaping	62	31%	13%	11%	45%
Water skiing/wake boards/tubing	63	32%	27%	16%	25%
Paddle boating	62	66%	5%	8%	21%
Fishing from shore	65	38%	26%	15%	20%
Birding	60	67%	12%	5%	17%
Photography	60	52%	32%	5%	12%
Jet skiing (personal watercraft)	61	82%	3%	3%	11%
Canoeing/ Kayaking	60	80%	7%	8%	5%
Scuba diving/ Snorkeling	60	87%	8%	3%	2%
Water fowl hunting	61	89%	8%	2%	2%
Sailboating	60	97%	2%	2%	0%

19. To what extent do you feel each of the following was a problem on Lake Andrews during this past **SUMMER**, *April 2001 through October 2001*?	Count	Average	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Catching too few fish	62	2.10	1.41	29%	23%	19%	11%	6%	11%
Noise from jet skiers (personal watercraft)	62	1.98	1.21	40%	29%	15%	8%	5%	3%
Litter in the lake	63	1.79	0.68	25%	60%	11%	0%	0%	3%
Careless or inconsiderate watercraft operators	63	1.75	1.03	40%	33%	17%	0%	3%	6%
Too many jet skis (PWCs) on the lake	62	1.74	1.17	44%	27%	11%	6%	3%	8%
Boats going too fast	63	1.60	1.01	51%	25%	13%	3%	2%	6%
Litter at the public landing or on the access road	64	1.39	1.08	27%	36%	11%	0%	2%	25%
Fishing "disturbed" due to overcrowding on the lake	62	1.32	0.86	58%	27%	2%	2%	2%	10%
Too many boats on the lake	63	1.32	0.88	70%	14%	6%	2%	2%	6%
Larger boats using the lake	63	1.27	0.87	67%	14%	8%	0%	2%	10%
Too many people fishing	62	1.26	0.81	63%	23%	3%	0%	2%	10%
Fishing Tournaments on the lake	62	1.24	1.05	61%	13%	5%	2%	3%	16%
Trespassing on your property	64	1.22	0.77	83%	8%	3%	2%	2%	3%
Not enough law enforcement on the lake	63	1.19	1.05	63%	10%	5%	2%	3%	17%
Vandalism of your property	64	0.97	0.18	97%	0%	0%	0%	0%	3%

21. Given the conditions on Lake Andrews this past **SUMMER**, *April 2001 through October 2001*, how do you feel about each of the following actions?

	Count	**Average**	Standard Deviation	Strongly Support	Support	Neither Support or Oppose	Oppose	Strongly Oppose
Establish "no fishing" areas for spawning fish	66	1.77	0.91	50%	27%	18%	5%	0%
Provide artificial spawning beds	65	1.97	0.81	32%	40%	26%	2%	0%
Limit development on and around Lake Andrew	67	2.00	1.00	40%	28%	22%	9%	0%
Require boats to have the same "no wake" zone regulations as jet skis (restricted to no-wake speed within 150 feet of non-motorized boats, shore, docks, swim rafts, swimmers or any moored or anchored boat).	67	2.09	1.22	40%	33%	10%	10%	6%
Seek more aggressive enforcement of safety rules and regulations for jet ski (PWC) operators	66	2.20	1.00	24%	44%	24%	3%	5%
Create situation in Mud Lake to prevent winter kill	60	2.23	1.00	25%	38%	28%	5%	3%
Provide more information for visitors at public landing(s)	67	2.27	0.83	19%	37%	42%	0%	1%
Seek more aggressive enforcement of safety rules and regulations for boat operators	67	2.40	0.91	15%	40%	37%	4%	3%
Reestablish lost aquatic vegetation	67	2.43	0.87	12%	43%	37%	4%	3%
Create size limitations on other fish species. (List)	36	2.53	1.06	28%	6%	53%	14%	0%
Remove the 24-inch limit on Northern Pike	62	2.65	1.29	27%	15%	34%	15%	10%
Modify the 24-inch limit on Northern Pike (explain	40	2.93	0.94	13%	5%	65%	13%	5%
Continue the 24-inch limit on Northern Pike	56	2.98	1.31	21%	7%	38%	20%	14%
Other (describe):								

Appendix B

Lake Latoka Survey Results

				Percentage					
Question 10: To what extent do you feel each of the following to be a problem on Lake Latoka?	Count	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Aquatic plant growth in Lake Latoka	198	2.26	1.22	18%	31%	29%	10%	4%	8%
Improper alteration to shoreline made by property owners	199	2.18	1.39	25%	26%	20%	13%	7%	11%
Algae growth in Lake Latoka	200	2.09	1.16	21%	39%	21%	8%	3%	9%
Lakeshore erosion	199	2.04	1.15	27%	37%	19%	7%	4%	7%
Overall water quality of Lake Latoka	205	2.00	1.01	32%	37%	21%	6%	1%	3%
Pollutants brought to lake through area ditches and culverts	202	1.98	1.34	18%	27%	23%	12%	2%	18%
County land and resources ordinances not followed or enforced	200	1.97	1.48	36%	21%	13%	9%	10%	13%
Improper burning of leaves and brush	201	1.76	1.07	40%	31%	14%	5%	2%	7%
Water level fluctuations on Lake Latoka	199	1.69	0.96	45%	29%	17%	4%	1%	6%
Lake water pollution due to agricultural runoff	202	1.69	1.19	25%	31%	18%	5%	1%	19%
Lake water pollution due to agricultural chemicals	201	1.68	1.22	25%	30%	18%	5%	1%	20%
Inadequate response of public officials to your concerns	196	1.44	1.23	47%	15%	10%	5%	3%	19%
Neighbors causing disturbances (i.e. noise)	200	1.40	0.90	69%	16%	8%	2%	2%	4%
Inadequate public service (i.e. roads, snowplowing of roads, utilities)	200	1.31	0.73	68%	20%	6%	2%	0%	6%
Trees lost to disease	201	1.27	0.91	51%	26%	4%	1%	1%	16%
Well water contamination due to agricultural chemicals	199	1.25	1.10	44%	16%	12%	3%	1%	26%
Inadequate public safety (i.e. fire, health, emergency, police/sheriff)	198	1.14	0.67	78%	9%	5%	1%	1%	8%

15. Estimate how many days members of your household used Lake Latoka for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Hiking/walking	166	49%	20%	8%	22%
Snowmobiling/ATV Riding	169	69%	14%	5%	11%
Ice fishing (in a fish house)	171	67%	15%	8%	11%
Ice skating (other than hockey)	165	75%	18%	3%	4%
ATV riding	159	94%	2%	1%	3%
Ice fishing (without a fish house)	165	64%	32%	2%	2%
Cross Country Skiing	165	82%	13%	4%	1%
Snowshoeing	162	93%	6%	0%	1%
Hockey	162	94%	3%	2%	1%

				Percentage					
Question 16: To what extent do you feel each of the following was a problem on Lake Latoka during this past WINTER, November 2000 through March 2001?	Count	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Litter on the lake	167	1.81	1.19	26%	34%	17%	7%	2%	14%
Catching too few fish	165	1.69	1.48	36%	10%	17%	10%	5%	23%
Inconsiderate users of snowmobiles/ATVs on the lake	166	1.60	1.08	47%	26%	11%	5%	2%	10%
Lake users operating vehicles in an unsafe manner	167	1.56	1.02	35%	31%	17%	1%	1%	15%
Noise from snowmobiles on the lake	166	1.52	1.00	54%	22%	13%	1%	2%	8%
Lake users being inconsiderate	166	1.40	0.91	56%	22%	8%	4%	0%	10%
Litter at the public landings or on the access roads	164	1.38	1.15	28%	29%	12%	2%	1%	27%
Trespassing on your property by lake users	168	1.30	0.81	71%	13%	7%	3%	0%	6%
Too many snowmobiles on the lake	165	1.24	0.80	66%	15%	8%	0%	1%	10%
People on the ice during unsafe ice conditions	164	1.23	0.90	51%	23%	7%	1%	1%	18%
Unattractive fish houses on the lake	164	1.15	0.75	75%	12%	2%	1%	1%	9%
Not enough law enforcement on the lake	165	1.12	0.89	64%	12%	4%	2%	1%	18%
Vandalism of your property by lake users	170	1.02	0.41	89%	4%	1%	1%	0%	5%
Too many fish houses on the lake	162	0.96	0.47	85%	4%	1%	1%	0%	10%
Vandalism of your fish house by lake users	148	0.88	0.47	81%	1%	1%	0%	0%	16%

17. Estimate how many days members of household used Lake Latoka for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Pleasure boating (in motorized boat)	197	7%	15%	15%	62%
Swimming	200	13%	16%	18%	54%
Walking/hiking	195	24%	16%	9%	51%
Fishing from a boat	195	18%	17%	21%	44%
Fishing from shore	192	30%	30%	15%	25%
Water skiing	195	45%	22%	12%	22%
Paddle boating	196	58%	18%	8%	16%
Jet skiing (personal watercraft)	193	82%	4%	3%	11%
Scuba diving/ Snorkeling	194	86%	8%	3%	3%
Canoeing/ Kayaking	194	79%	12%	6%	3%
Sailboating	193	95%	3%	1%	1%
Waterfowl hunting	190	99%	1%	0%	0%

				Percentage					
Question 19: To what extent do you feel each of the following was a problem on Lake Latoka during this past SUMMER, April 2001 through September 2001?	Count	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Noise from jet skiers (personal watercraft)	194	2.64	1.33	22%	27%	24%	13%	13%	1%
Too many jet skis (PWCs) on the lake	195	2.45	1.38	31%	25%	19%	11%	12%	1%
Careless or inconsiderate watercraft operators	192	2.19	1.17	27%	34%	20%	11%	4%	4%
Catching too few fish	185	2.02	1.44	34%	18%	17%	12%	6%	12%
Boats going too fast	191	1.99	1.07	38%	34%	17%	8%	2%	2%
Litter in the lake	193	1.88	0.87	28%	50%	15%	4%	1%	4%
Too many boats on the lake	190	1.63	0.99	54%	26%	13%	2%	3%	4%
Fishing “disturbed” due to overcrowding on the lake	189	1.61	1.04	50%	24%	14%	4%	2%	7%
Larger boats using the lake	186	1.58	0.97	60%	18%	14%	3%	2%	3%
Litter at the public landings or on the access roads	190	1.51	1.03	36%	34%	10%	4%	1%	16%
Not enough law enforcement on the lake	189	1.41	1.04	58%	19%	7%	4%	2%	11%
Fishing Tournaments on the lake	186	1.25	1.12	61%	10%	6%	2%	4%	18%
Too many people fishing	190	1.17	0.68	77%	13%	2%	1%	1%	6%
Trespassing on your property by lake users	192	1.16	0.58	83%	9%	4%	1%	0%	3%
Vandalism of your property by lake users	192	1.07	0.41	91%	4%	3%	0%	0%	3%

21. Given the conditions on Lake Latoka this past SUMMER, April 2000 through September 2001, how do you feel about each of the following actions?	Count	**Average**	Standard Deviation	Strongly Support	Support	Neither Support or Oppose	Oppose	Strongly Oppose
Increase efforts for early detection of the presence of Eurasian Watermilfoil in Lake Latoka	198	1.39	0.59	67%	28%	6%	0%	0%
Provide more stocking of game fish	194	1.64	0.82	55%	28%	14%	2%	1%
Seek more aggressive enforcement of safety rules and regulations for jet ski (PWC) operators	192	1.78	0.93	50%	29%	15%	7%	0%
Provide better control of rough fish	191	1.88	0.86	38%	40%	19%	1%	2%
Improve enforcement of “no wake” zone laws	196	2.06	0.88	32%	33%	31%	4%	0%
Provide more information for visitors at public landing(s)	193	2.25	0.84	19%	42%	33%	5%	1%
Seek more aggressive enforcement of safety rules and regulations for boat operators	195	2.26	0.87	19%	44%	29%	7%	1%
Establish speed limits for motorized watercraft	196	2.63	1.09	18%	27%	33%	18%	4%
Stock perch in Lake Latoka	193	2.81	1.19	18%	18%	37%	18%	9%
Raise the water level of Lake Latoka	191	2.93	1.14	14%	16%	45%	15%	11%
Lower the water level of Lake Latoka	180	3.69	0.94	2%	2%	46%	26%	25%
Stock muskies in Lake Latoka	196	3.74	1.20	7%	8%	23%	28%	34%

Appendix C

Lake L'Homme Dieu Survey Results

10. To what extent do you feel each of the following to be a problem on Lake L'Homme Dieu?	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Aquatic plant growth in Lake L'Homme Dieu	2.68	1.29	7%	25%	37%	14%	9%	8%
Algae growth in Lake L'Homme Dieu	2.51	1.26	7%	33%	33%	11%	7%	9%
Pollutants brought to lake through area ditches and culverts	2.46	1.53	8%	24%	25%	17%	9%	17%
Lakeshore erosion	2.35	1.32	14%	34%	23%	11%	7%	9%
Overall water quality of Lake L'Homme Dieu	2.32	1.09	17%	31%	37%	7%	3%	5%
Water level fluctuations on Lake L'Homme Dieu	2.09	1.08	23%	44%	19%	6%	4%	5%
Improper burning of leaves and brush	1.75	1.22	36%	29%	14%	5%	4%	13%
Improper alteration to shoreline made by property owners	1.74	1.34	33%	25%	14%	6%	5%	17%
Inadequate response of public officials to your concerns	1.64	1.34	33%	17%	18%	8%	2%	22%
Lake water pollution due to agricultural chemicals	1.63	1.37	22%	24%	17%	8%	2%	27%
Lake water pollution due to agricultural runoff	1.61	1.30	24%	29%	15%	6%	2%	25%
County land and resources ordinances not followed or enforced	1.48	1.35	36%	19%	9%	6%	4%	25%
Neighbors causing disturbances (i.e. noise)	1.46	1.24	69%	17%	6%	1%	2%	3%
Trees lost to disease	1.41	1.02	35%	31%	11%	2%	0%	21%
Inadequate public service (i.e. roads, snowplowing of roads, utilities)	1.26	0.85	66%	17%	5%	2%	1%	10%
Inadequate public safety (i.e. fire, health, emergency, police/sheriff)	1.26	0.81	67%	15%	7%	1%	0%	9%
Well water contamination due to agricultural chemicals	1.18	1.04	42%	19%	8%	3%	0%	28%

15. Estimate how many *days* members of your household and guests used Lake L'Homme Dieu for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Lake Viewing	167	13%	4%	5%	77%
Hiking/walking/Running	162	41%	12%	10%	37%
Ice fishing (in a fish house)	163	77%	13%	4%	7%
Snowmobiling/ATV Riding	161	82%	9%	6%	3%
ATV riding	160	97%	1%	0%	2%
Cross Country Skiing	160	81%	15%	3%	2%
Ice skating (other than hockey)	158	90%	7%	2%	1%
Ice fishing (without a fish house)	159	79%	17%	3%	1%
Hockey	157	96%	4%	0%	1%
Snowshoeing	153	95%	4%	1%	0%

16. To what extent do you feel each of the following was a problem on Lake L'Homme Dieu during the past few **WINTERS,** November through March?	Count	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Lake users operating vehicles in an unsafe manner	145	1.85	1.31	24%	29%	21%	4%	5%	17%
Litter on the lake	146	1.78	1.20	23%	36%	17%	3%	3%	16%
Ice Fishing Contests	144	1.77	1.60	43%	8%	11%	8%	10%	19%
People on the ice during unsafe ice conditions	147	1.75	1.29	23%	29%	18%	6%	3%	20%
Inconsiderate users of snowmobiles/ATVs on the lake	140	1.61	1.24	39%	25%	12%	4%	4%	16%
Noise from snowmobiles on the lake	143	1.60	1.18	42%	24%	12%	5%	3%	14%
Too many snowmobiles on the lake	140	1.53	1.20	41%	22%	14%	2%	4%	17%
Lake users being inconsiderate	146	1.52	1.17	47%	22%	10%	3%	3%	14%
Trespassing on your property by lake users	146	1.29	1.00	63%	13%	6%	3%	2%	13%
Catching too few fish	137	1.28	1.35	39%	12%	7%	7%	4%	32%
Inadequate maintenance of public landings	146	1.27	2.66	50%	14%	5%	2%	1%	27%
Not enough law enforcement on the lake	144	1.24	1.15	47%	15%	6%	4%	2%	25%
Vandalism of your property by lake users	146	1.04	0.59	83%	5%	2%	1%	0%	9%
Unattractive fish houses on the lake	140	1.04	0.78	62%	14%	2%	1%	1%	20%
Too many fish houses on the lake	141	1.00	0.79	65%	9%	4%	1%	1%	21%
Vandalism of your fish house by lake users	129	0.85	0.45	78%	4%	0%	0%	0%	19%

17. Estimate how many *days* members of household and guests used Lake L'Homme Dieu for the following activities?	Count	0 days	1 - 5 days	6 - 10 days	**11 or more days**
Lake Viewing	206	0%	4%	3%	92%
Pleasure boating (in motorized boat)	207	3%	11%	10%	76%
Walking/running/biking	191	8%	10%	7%	74%
Walking/hiking/running/biking	205	11%	10%	10%	69%
Swimming	206	12%	16%	14%	59%
Fishing from a boat	205	19%	19%	20%	43%
Fishing from shore	207	30%	20%	16%	34%
Water skiing	205	32%	24%	16%	28%
Jet skiing (personal watercraft)	204	75%	10%	2%	13%
Paddle boating	203	75%	10%	5%	9%
Canoeing/ Kayaking	201	71%	15%	5%	8%
Sailboating	200	83%	6%	4%	8%
Scuba diving/ Snorkeling	201	85%	9%	2%	3%

19. To what extent do you feel each of the following was a problem on Lake L'Homme Dieu during this past **SUMMER**, *April 2001 through October 2001*?

	Count	**Average**	Standard Deviation	Not a problem	A slight problem	A moderate problem	A serious problem	A very serious problem	Don't know
Noise from jet skiers (personal watercraft)	211	2.94	1.40	16%	25%	23%	15%	20%	1%
Too many jet skis (PWCs) on the lake	209	2.74	1.44	21%	24%	23%	12%	18%	2%
Fishing Tournaments on the lake	209	2.60	1.65	29%	15%	16%	12%	21%	7%
Weed infestation	208	2.60	1.31	14%	26%	30%	14%	9%	6%
Boats going too fast	209	2.52	1.45	20%	30%	29%	9%	9%	3%
Careless or inconsiderate watercraft operators	208	2.45	1.23	20%	36%	22%	12%	8%	2%
Too many boats on the lake	113	2.21	1.26	33%	28%	20%	9%	7%	3%
Catching too few fish	202	2.09	1.50	33%	20%	16%	9%	10%	11%
Litter in the lake	208	2.06	0.95	18%	50%	20%	4%	1%	5%
Fishing "disturbed" due to overuse of the lake	210	1.89	1.32	30%	26%	17%	9%	4%	14%
Litter at the public landings or on the access roads	208	1.79	1.26	19%	37%	15%	7%	2%	19%
Larger boats using the lake	205	1.70	1.15	48%	23%	13%	5%	3%	7%
Not enough law enforcement on the lake	207	1.69	1.13	50%	20%	15%	6%	2%	7%
Too many people fishing	209	1.50	1.07	61%	17%	9%	3%	3%	7%
Trespassing on your property by lake users	210	1.26	0.66	79%	12%	5%	2%	0%	2%
Vandalism of your property by lake users	211	1.09	0.53	91%	4%	1%	1%	0%	3%

21. Given the conditions on Lake L'Homme Dieu this past **SUMMER**, *April 2001 through October 2001* , how do you feel about each of the following actions?

	Count	**Average**	Standard Deviation	Strongly Support	Support	Neither Support or Oppose	Oppose	Strongly Oppose
Restrict parking near Rotary Beach on Cty. Rd. 42	200	2.43	1.04	24%	24%	41%	9%	3%
Establish speed limits for motorized watercraft	203	2.40	1.09	23%	33%	29%	11%	4%
Provide more information for visitors at public landing(s)	205	2.08	0.78	23%	49%	26%	2%	0%
Seek more aggressive enforcement of safety rules and regulations for boat operators	207	2.08	0.83	24%	50%	21%	4%	1%
Develop a walking/running/bike path around the lake	198	2.05	1.24	47%	21%	18%	8%	6%
Provide better control of rough fish	199	1.99	0.72	26%	48%	26%	0%	0%
Improve enforcement of “no wake” zone laws	208	1.88	0.83	35%	46%	16%	1%	1%
Provide more stocking of game fish	201	1.74	0.71	41%	45%	14%	0%	0%
Seek more aggressive enforcement of safety rules and regulations for jet ski (PWC) operators	204	1.65	0.81	53%	33%	11%	2%	0%
Increase efforts to control weed infestation	210	1.45	0.68	62%	32%	5%	0%	1%

PROPOSED ORDINANCE MODIFICATIONS

Existing development or redevelopment within the watershed:

- Allowable impervious coverage limits should be reduced by 10% in all districts within 1,000 feet of the lake.
- Add a provision to allow, with a conditional use permit, a property owner to increase impervious coverage by up to 10% (obtain the old standard). Submittals for a conditional use permit should include a stormwater retention plan.

Sample Ordinance Language

Impervious Coverage. Impervious coverage may be increased by 10% through a conditional use permit if the following is provided:

A. A storm water retention plan submitted showing containment of the 5-year, 24-hour storm event on the parcel.
B. An agreement by the property owner to perpetually maintain the retention capacity.
C. Direct runoff of stormwater to adjacent water bodies, wetlands and adjacent parcels, shall be eliminated through the use of berms or other permanent means.

New development within the watershed:

- Add a provision to the subdivision ordinance that all new subdivisions, excluding those done by metes and bounds, must retain their additional runoff within the development.
- Design must be based on build-out runoff scenarios.

Sample Ordinance Language

Preliminary Plat submissions shall include the following:

A. A storm water retention plan for the entire subdivision. The plan shall be designed to not increase the amount of runoff from the parcel to be developed. The plan shall include:
    1. A calculation of existing runoff volume for a 100-year, 24-hour storm event. Runoff volume is the volume of stormwater that would leave the site.
    2. A calculation of runoff volume for the development at build-out (maximum allowable impervious coverage) for a 100-year, 24-hour storm event. Runoff volume is the volume of stormwater that would leave the site.
    3. Design of stormwater retention/infiltration areas with adequate capacity to handle the additional runoff created by the development.
    4. Identification of stormwater routing mechanisms. Stormwater routing mechanisms must be designed to carry the 100-year, 24-hour storm event.

Final Plat submissions shall include the following:

A. An agreement whereby stormwater retention capacity and stormwater routing

capacity would be maintained. Agreements could include, but are not limited to, an easement agreement with the local unit of government, documents within a home-owners association or a guaranteed long-term maintenance contract.

Appendix D

Proposed Revisions to the Douglas County Land Use and Subdivision Ordinances

PROPOSED ORDINANCE MODIFICATIONS

Existing development or redevelopment within the watershed:

- Allowable impervious coverage limits should be reduced by 10% in all districts within 1,000 feet of the lake.
- Add a provision to allow, with a conditional use permit, a property owner to increase impervious coverage by up to 10% (obtain the old standard). Submittals for a conditional use permit should include a stormwater retention plan.

Sample Ordinance Language

Impervious Coverage. Impervious coverage may be increased by 10% through a conditional use permit if the following is provided:

A. A storm water retention plan submitted showing containment of the 5-year, 24-hour storm event on the parcel.
B. An agreement by the property owner to perpetually maintain the retention capacity.
C. Direct runoff of stormwater to adjacent water bodies, wetlands and adjacent parcels, shall be eliminated through the use of berms or other permanent means.

New development within the watershed:

- Add a provision to the subdivision ordinance that all new subdivisions, excluding those done by metes and bounds, must retain their additional runoff within the development.
- Design must be based on build-out runoff scenarios.

Sample Ordinance Language

Preliminary Plat submissions shall include the following:

A. A storm water retention plan for the entire subdivision. The plan shall be designed to not increase the amount of runoff from the parcel to be developed. The plan shall include:
    1. A calculation of existing runoff volume for a 100-year, 24-hour storm event. Runoff volume is the volume of stormwater that would leave the site.
    2. A calculation of runoff volume for the development at build-out (maximum allowable impervious coverage) for a 100-year, 24-hour storm event. Runoff volume is the volume of stormwater that would leave the site.
    3. Design of stormwater retention/infiltration areas with adequate capacity to handle the additional runoff created by the development.
    4. Identification of stormwater routing mechanisms. Stormwater routing mechanisms must be designed to carry the 100-year, 24-hour storm event.

Final Plat submissions shall include the following:

A. An agreement whereby stormwater retention capacity and stormwater routing

capacity would be maintained. Agreements could include, but are not limited to, an easement agreement with the local unit of government, documents within a home-owners association or a guaranteed long-term maintenance contract.